communicated across the isolation barrier circuit and reconverted back to the digital output signal.

The Applicants' claimed invention, in part, incorporates the functionality of a D/A and A/D converter with the functionality of a DAA (data access arrangement). This enables the Applicants' DAA to be independent of, and to interface with many analog signal standards including ADSL and POTS while providing a digital input and output electronic interface (Page 3, Lines 18-21) (Page 10, Lines 4-7).

Another benefit of the Applicants' claimed invention is that the communication of an analog signal, as opposed to a digital signal, over an isolation barrier provides increased signal bandwidth. Per unit time, an analog signal can encode more information than a digital signal. Accordingly, the claimed invention can provide sufficient bandwidth to support multiple types of modems, for example, in both the ADLS and POTS environments and to support other "high data rate transmission requiring isolation such as medical, telephone, industrial processes and other communications applications " (Page 3, Lines 6-7, 18-21).

The Examiner rejects claims 1-11, 13-20, 21-24 under 35 U.S.C. §103 (a) as being obvious over *Ehlig et al.* (U.S. Patent No. 5,550,993) in view of *Rahamim et al.* (U.S. Patent No. 6,081,586).

The Examiner indicates that *Ehlig's* generic DAA constitutes an isolation barrier. The Examiner states "Ehlig et al teaches analog communication across an isolation barrier in the form of data access arrangement (DAA) 787" and "Ehlig et al teaches a generic DAA". The Examiner admits, however, that *Ehlig* does not disclose expressly an isolation element, such as [a] capacitor or a transformer of the DAA".

The Examiner identifies *Ehlig*'s use of a "[digital to analog] converter 539 having an

analog output...connected to the DAA". The Examiner also identifies *Ehlig's* use of an "analog to digital (A/D) converter 785 having an input coupled to the analog output of the DAA". *Ehlig* states that "Unit 785 provides analog communication to DAA 787" (Col. 33, Lines 35-45).

Ehlig, however, does not teach or suggest the A/D and D/A functionality of the Applicants' claimed invention. Applicants' claim 1 also recites, in part, "an input digital signal communicated across the isolation barrier" (underline added), indicating that the input signal is communicated from one side of the isolation barrier to the opposite side of the isolation barrier.

Referring to *Ehlig's* Fig. 18, note that *Ehlig's* DAA 787 communicates bi-directionally and that both the A/D 785 and D/A 785 converters are located on only one side (opposite the line side) of the DAA 787 while the opposite side (line side) of the DAA 787 is directly connected to an (analog) telephone line 773. The communication path between the DAA 787 and the telephone line 773 lacks any A/D or D/A converters.

If the DAA 787 acts as an isolation barrier, a input digital signal could not be communicated from one side of the isolation barrier to the opposite side of the isolation barrier. *Ehlig* does not teach or suggest any D/A conversion to the DAA and A/D from the DAA along the same direction of communication. The D/A converter connected to the DAA input and the A/D converter connected to the DAA output are connected along opposite directions of communication to and from the DAA. *Ehlig's* use of A/D and D/A converters is unlike that disclosed by the Applicants' invention. Consequently, *Ehlig* does not teach or suggest the subject matter of the Applicants' claim 1.

Furthermore, *Ehlig* does not teach or suggest the communication of analog signals

across an isolation barrier circuit, nor mention of the use of an isolation barrier circuit as claimed by the Applicants. As stated by the Examiner, *Ehlig* makes no reference to any use of a capacitor nor to a transformer which could possibly be used a component of an isolation barrier.

Instead, *Ehlig's* A/D and D/A conversion surround digital components, such as device 11 as shown in *Ehlig's* Fig. 20. *Ehlig* states, "the buses that switch hard and fast are thus isolated from buses that are not switching [...] (column 48, line 12). Therefore, the isolation of the ground and power plane is optimized".

Ehlig's only reference to isolation functionality involves buses and pins, which indicates isolation between digital electronic components and not isolation of analog signal communication over an isolation barrier circuit. *Ehlig* makes no reference to any other type of isolating functionality.

Moreover, *Rahamim* does not teach or suggest the communication of analog signals across an isolation barrier circuit nor mention of the use of an isolation barrier circuit. Instead, *Rahamim* describes a modem using a DAA and a (high voltage) digital isolation barrier (Col. 4, Lines 12-13). *Rahamim* discloses an isolation barrier that carries only digital, and not analog signals. *Rahamim* discloses no other type of isolating functionality.

Furthermore, *Rahamim* teaches away from the claimed invention. *Rahamim* states "passing analog audio signals across the high voltage isolation barrier for provision to a coder/decoder (CODEC) and other DAA circuitry hampers efforts to decrease the size and cost of the barrier due to the foregoing design constraints. Furthermore, each signal path across the barrier adds to size and expense of the high voltage isolation barrier" (Column 3, Lines 5-11).

Thus, the proposed combination of *Ehlig* and *Rahamim* cannot teach or suggest the Applicants' claimed invention. Neither *Ehlig* nor *Rahamim* disclose circuitry that communicates analog signals across an isolation barrier. *Rahamim* only communicates digital signals. *Ehlig* does not isolate analog components and uses digital to analog converters in a manner different than that claimed by the Applicant.

Regarding claims 17-20, the Examiner states "a constant average voltage [(constant average signal)] denotes an inherent feature of an analog communication system across an isolation barrier". The Examiner also identifies the generic DAA of *Ehlig* as an analog signal isolation barrier.

A "constant average voltage" (constant average signal), however, is NOT an inherent feature of a DAA nor an inherent feature of an analog communication system across an isolation barrier. For example, a POTS DAA design specification, may require a maximum average, but not a constant average signal. For further example, both *Ehlig* and *Rahamim* each describe DAA functionality. Neither *Ehlig* nor *Rahamim*, describe constant average signal functionality.

The Examiner rejects claim 12 under 35 U.S.C. §103(a) as being unpatentable over a combination of *Ehlig et al.* and *Rahamim et al.* as applied to claims 1-11 above and in further view of *Chea, Jr.* (U.S. Patent No. 4,387,273).

Claim 12 is asserted to distinguish over the prior art because, at minimum, it depends from claim 1 which is asserted to distinguish over the prior art as explained above.

Furthermore, *Chea* implements common mode rejection using methods (control of impedance) other than those employed by the Applicants' invention and applies common mode rejection to the removal of common mode interference from a telephone subscriber line

and not from an analog signal passing through an isolation barrier as with the Applicants' invention.

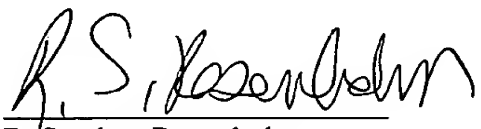
Claims 1-11, 13-20 and 21-24 are asserted to distinguish over the prior art because, at minimum, they depend from claim 1 and claim 21 which are asserted to distinguish over the prior art as explained above.

In summary, as explained above, none of the *Ehlig*, *Rahamim* nor *Chea* references, separately or combined, teach or suggest the claimed subject matter of the Applicant's claims 1-24.

CONCLUSION

Accordingly, independent claims 1 and 21 and dependent claims 2-20 and 21-24 are allowable over the cited art. Early and favorable action is respectfully requested. If for any reason this Response is found to be incomplete, or if at any time it appears that a telephone conference with counsel would help advance prosecution, please telephone the undersigned, or his associates, collect in Waltham, Massachusetts, at (781) 890-5678.

Respectfully submitted,



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